

CLAIMS

1. Use for improving the hydro- and oil-repellence properties of substrata with a low surface energy having a critical wetting tension lower than 40 mN/meter, of (per)fluoropolyether mono- and bifunctional derivatives having the following structures:



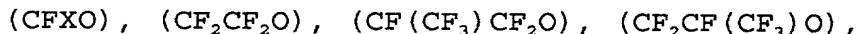
wherein:

L is a linking organic group $-\text{CO}-\text{NR}'-(\text{CH}_2)_q-$, with $\text{R}'=\text{H}$ or C_1-C_4 alkyl; q is an integer comprised between 1 and 8, preferably 1-3;

$\text{Y}=\text{F}, \text{CF}_3$;

W is a $-\text{Si}(\text{R}_1)_\alpha(\text{OR}_2)_{3-\alpha}$ group with $\alpha=0,1,2$, R_1 and R_2 equal to or different from each other are C_1-C_6 alkyl groups, optionally containing one or more ether O, C_6-C_{10} aryl groups, C_7-C_{12} alkyl-aryls or aryl-alkyls;

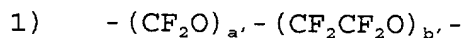
R_f has a number average molecular weight in the range 200-5,000, preferably 300-2,000 and it comprises repeating units having at least one of the following structures, statistically placed along the chain:



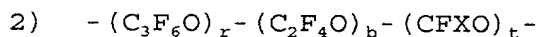
wherein $\text{X} = \text{F}, \text{CF}_3$.

2. Use according to claim 1, wherein R_f has one of the follo-

wing structures:

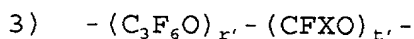


with a'/b' comprised between 0.5 and 2, extremes included, a' and b' being integers such to give the above mentioned molecular weight;



with $r/b = 0.5-2.0$; $(r+b)/t$ is in the range 10-30,

b , r and t being integers such as to give the above mentioned molecular weight, X has the above indicated meaning;



t' can be 0;

when t' is different from 0 then $r'/t' = 10-30$,

r' and t' being integers such to give the above mentioned molecular weight; X has the above indicated meaning;

3. Use according to claims 1-2, wherein in structure (II) the other end group is of T-O- type, wherein T is a (per)fluoroalkyl group selected from: $-\text{CF}_3$, $-\text{C}_2\text{F}_5$, $-\text{C}_3\text{F}_7$, $-\text{CF}_2\text{Cl}$, $-\text{C}_2\text{F}_4\text{Cl}$, $-\text{C}_3\text{F}_6\text{Cl}$; optionally one or two F atoms, preferably one, can be replaced by H.
4. Use according to claims 1-3, wherein the compounds (I) and (II) are used in mixture.
5. Use according to claims 1-4, wherein the perfluoropolyether derivatives have formula (I) with R_f having structure

re (3).

6. Use according to claims 1-5, wherein the substrata having a low surface energy are selected from the groups consisting of:

polytetrafluoroethylene, polyolefins, polyolefine elastomers, thermoplastic copolymers of tetrafluoroethylene, thermoplastic homopolymers and copolymers of vinylidenefluoride or of chlorotrifluoroethylene.

7. Use according to claims 1-6, wherein the (per)fluoropolyether derivatives are applied on the substrata by brushing, spraying, padding.
8. Use according to claims 1-7, wherein the (per)fluoropolyether derivatives are used in formulations comprising solvents or water/solvent mixtures.
9. Use according to claim 8, wherein the solvents are polar and are selected from the following classes:
aliphatic alcohols having from 1 to 6 carbon atoms; aliphatic glycols having from 2 to 8 carbon atoms, optionally having an esterified hydroxyl; ketones or esters having from 3 to 10 carbon atoms.
10. Use according to claims 8-9, wherein as water/solvent mixtures, ketone/water or alcohol/water mixtures in a ratio by volume between 10:90 and 90:10 are used.
11. Use according to claims 8-10, wherein in the formulations

the concentration of the (per)fluoropolyethers of formula (I) and (II) is generally in the range 0.1-30% by weight.

12. Use according to claims 1-11, wherein the amount of (per)-fluoropolyether compound applied on the substratum surface is in the range 0.1-20 g/m².
13. Use according to claims 1-12, wherein the polar solvent is combined with water, optionally in the presence of a silanization catalyst.
14. Use according to claims 1-12, wherein a thermal treatment cycle to favour the crosslinking is used.